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XIV.—*Notes on British Spiders, with Descriptions of some new Species.* By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S., &c.

[Plate XI.]

My last communication on British spiders was made two years ago (*Ann. & Mag. Nat. Hist.* 1875, xvi. pp. 237–260, pl. viii.). Since that time numerous other avocations have prevented any very extended researches in British arachnology. The results, however, of my own observations, and of the kind help of some other naturalists, are subjoined. From these results I have now to record five species supposed to be new to science, and five others previously described, but only discovered in Great Britain during the last two years. Ten species are thus added to our list of indigenous spiders, which now reaches a total of 484 species. Details of all these additions will be found below, as well as some rectifications of synonymy, with observations on habits and other points conceived to be of interest to araneologists, both in respect to the new additions and to some other species also.

In the communication mentioned above, I remarked upon the very scanty materials extant for any list or history of *Irish* spiders; and an appeal was made to Irish naturalists to collect and send me spiders from Ireland. I have had one kind response to this from Mr. T. Workman of Belfast, who has sent me a good many spiders during the last year, all of them, however, belonging to species already known, and one only being of any rarity—*Drepanodus albipunctatus*, Cambr. (*vide*

infra, p. 115). I now await further collections, kindly promised to me by Mr. Workman; and I venture again to ask other Irish naturalists to collect and send me spiders from their several localities, so that after a while I may have a fair amount of material for a "List of the Spiders of Ireland." Collectors need not be at the trouble of separating their captures; all I desire is some of every kind; and these can be safely sent to me by post in strong half-ounce or one-ounce phials.

Order ARANEIDEA.

Fam. Theraphosides.

Genus ATYPUS, Latr.

Atypus piceus.

Atypus piceus, Sulzer, Cambr. Ann. & Mag. N. H. 1875, xvi. p. 238, pl. viii. fig. 2.

Atypus Sulzeri, Blackw. Spid. Great Brit. & Ireland, p. 14, pl. i. fig. 1.

Since the publication of my last notice of this species (*l. c. supra*) no further materials have come before me for the more satisfactory determination of the synonymic position of this and our other species of the genus *Atypus*. I have, however, lately found a strong colony of this spider under the overhanging ledges of a heathy bank on Bloxworth Heath; and examples of both sexes in the adult state have been kindly sent to me not long since from Hampstead by Mr. F. Enock of London. The remarks made (*t. c. p.* 240) upon the nests of *A. Sulzeri*, have been fully confirmed by the observations made since upon the nests dug out here, and upon those received from Mr. Enock. On one point, however, I am still in doubt; and that is, in regard to the branch occasionally found leading into, or out of, the main tube. Out of ten tubes dug out on Bloxworth Heath, four were furnished with a branch; but no two of them exactly resemble each other, either in the size or in the position of the branch. In one instance the branch issued from the tube at about $2\frac{1}{2}$ inches from its lower extremity, and, running upwards at an acute angle, protruded from the surface among the heather-stems, exactly like the main tube and at about 3 inches from it, the branch, however, being about half the size of the tube, which measured $8\frac{1}{2}$ inches in length. In another instance the branch issued from the tube at about the same distance from its lower extremity, but, instead of running upwards, it ran *downwards*, at an acute angle, to a depth of about 2 inches, being, however, as large as,

if not rather larger than, the tube itself. In another instance (one of Mr. Enock's Hampstead examples) the branch issues close to the surface of the ground, and appears to form merely a short supernumerary entrance to the tube: in this case the branch is no more than an inch long. I am unable to conjecture what the significance of these branched tubes may be. In regard to the trapdoor spiders of South Europe, the researches of the late Mr. Moggridge appear to prove that the presence or absence of branches to the main tubes indicate specific distinctions in the spiders by which they are formed; in the present instance, however, this is certainly not so. A somewhat similar branching has been found to exist occasionally in the tubes of a New-Zealand species of *Nemesia* (*N. Gilliesii*, Cambr.); but in this instance I have conjectured that, the main tube having become choked (as has been the case) with débris of insects and other extraneous matters, the formation of a fresh portion of tube became necessary. In the branched tubes of *Atypus piceus* the branches have not been in any way choked. The enlargements met with in all the larger tubes are probably intended for the reception of the egg-cocoon, and subsequently for the accommodation of the infant brood until such time as they leave the home nest and form separate tubes for themselves. In all cases that have come before me the upper (and projecting) extremity of the nest has been devoid of any perceptible orifice. It struck me at first that there might be an elasticity in that portion of the tube, which, while permitting the spider to effect its exit and return, would cause the orifice again to close. I am now inclined to think that the spider gnaws its way out, and after its return closes the orifice by fresh threads with its spinners, an operation which it would perform without difficulty in a very few minutes.

Before separating and spinning tubes for themselves, the young brood appear to leave the home nest and take up their residence in an irregular web spun among the surrounding herbage. This, at least, is the conclusion I come to from Mr. Enock's finding a considerable number of young in a web on a broom-bush close to the colony in April 1876. These young were much smaller than 129 others found, in the November following, within a tube. One of the tubes dug out on Bloxworth Heath in September 1877 contained, in the enlargement near its lower extremity, about 100 very small young ones.

The three adult males found by Mr. Enock were all in tubes.

Fam. Dictynides.

Genus LETHIA, Menge.

Lethia patula, sp. n.

Lethia patula, Sim. (*in literis*).

Adult female, length 2 lines.

Cephalothorax oblong-oval, moderately convex above; caput rather long; lateral margins at its junction with the thoracic segments strongly constricted, fore part rather broad and truncated; occipital region rounded, and forming the highest part of the cephalothorax; hinder slope gradual; height of the clypeus greater than the diameter of one of the fore central eyes, but less than half the height of the facial space; the normal grooves and indentations are visible, but not strongly marked. The colour of the cephalothorax is yellow-brown, darkest on the caput, glossy, and with a few coarse hairs on the upper part, chiefly towards the fore part of the caput, and on the clypeus.

The *eyes* are of moderate dimensions, and not very unequal in size; they are disposed in four pairs, forming two nearly straight lines not far removed from each other. Those of the anterior row are separated from each other by equal intervals of about an eye's diameter. The interval between those of the hind central pair is rather less than that between each and the lateral eye of the same row on its side; those of each lateral pair are seated obliquely on a tubercle, but are distinctly separated from each other, though by a rather less interval than that which separates the fore and hind central pairs.

The *legs* are short and not very strong, and their relative length is 4, 1, 2, 3. They are of a brownish-yellow colour with a very faint trace of darker annulations, which may perhaps be more marked in some examples than in others; they are furnished with numerous coarse bristly hairs; and the posterior side of the metatarsi of the fourth pair have a calamistrum which runs throughout almost the whole length of the joint.

The *palpi* are of moderate length, and are similar in colour and armature to the legs.

The *fulces* are strong, of moderate length, prominent at their base in front, straight, and perpendicular; they are of a dark yellow-brown colour, furnished with bristly hairs, and armed at their extremities on the inner side with several small teeth of different sizes.

The *maxillæ* are rather large, of an elongate-oblong form, obliquely truncated on the outer sides at their extremity, and inclined towards the labium; they are of a yellow-brown colour, tipped with a paler hue, and furnished with coarse hairs, some of which (of a papilliform nature) form a kind of tuft at their extremities.

The *labium* is of an oblong form, rounded at its apex, and about two thirds as long as the *maxillæ*, to which it is similar in colour.

The *sternum* is heart-shaped, furnished with coarse hairs, and similar in colour to the cephalothorax.

The *abdomen* is oval, and of considerable convexity on the upperside; its colour is yellow-brown with various indistinct markings of a paler hue, many of them, however, being furnished with coarse whitish hairs; it has thence a more distinctly mottled appearance. Two pale longitudinal, rather broken, curved and opposed lines occupy the fore part of the upperside, and are followed (to the spinners) by several transverse angular lines or chevrons, formed of small pale spots, the terminal spot on each side being a small patch or blotch; the pale spots and markings on the sides assume a rather obliquely linear form. In front of the ordinary spinners, which are short and of a yellow-brown colour, is the supernumerary mamillary organ common to the genus. The genital aperture presents the appearance of two roundish reddish-brown openings rather widely separated in a transverse line, and nearly concealed by coarse, dark, bristly hairs.

Although very nearly allied to *Lethia puta* (Cambr.), and resembling it closely in general colours and appearance, this spider is easily distinguished by its much larger size and a different form of the genital aperture.

The specimen from which I have made the above description was kindly given to me by Mons. Eugène Simon, by whom it was found in the summer of 1870, at Newhaven, in Sussex. I have retained for this species the *nom de cabinet* under which it was sent to me by M. Simon.

Lethia albispiraculis, sp. n. (Pl. XI. fig. 1.)

Adult female, length $1\frac{1}{3}$ line.

This spider is nearly allied to *L. patula*, resembling it closely in its general form, hue, and appearance; it is, however, smaller; and the three examples examined are all of a darker hue and of a more closely freckled look upon the abdomen, upon which also the spots of white hairs are very distinct, though liable to be rubbed off, and so to leave only the brownish-yellow hue of the markings. A very tangible dis-

tion is furnished by the spiracular plates beneath the fore extremity of the abdomen: these are of a bright white colour, and in some examples are shining and very conspicuous.

Three examples, all females, were found under stones on the Chesil beach, close to the Isle of Portland, in June 1875. This spider is also nearly allied to *L. puta*, Cambr.; but it is rather larger, darker-coloured, and of a shorter, stouter form; it is also easily distinguished from that species by the white spiracular plates.

Fam. Drassides.

Genus GNAPHOSA, Latr.

Gnaphosa anglica.

Gnaphosa anglica, Cambr. Linn. Trans. xxvii. p. 410, pl. 54. fig. 10.

Adult and immature examples of both sexes of this rare and local species were found in parts of Bloxworth Heath from the 7th to the 16th of June, 1877. This spider secretes itself under stones, but chiefly under the dry crust formed by the desiccation of the small muddy puddles which abound wherever the turf has been previously pared off for fuel. In these situations there is generally, until after midsummer, the amount of dampness so essential to the life of many spiders.

Genus DRASSUS, Walck.

Drassus delinquens.

Drassus delinquens, Cambr. Ann. & Mag. N. H. 1875, xvi. p. 245, pl. viii. fig. 4.

An adult male and two adult females were found in similar situations to those in which the last species was found, on the 7th of June, 1877.

The male differs very little in size, colour, or markings from the female (though both sexes vary considerably in respect to size); as, however, the male has not yet been described, it will be well to make one or two observations upon it. With regard to size, the length of the male found is $2\frac{2}{3}$ lines, that of one of the females very nearly 3 lines, the other female being just 2 lines.

The *palpi* of the male are moderately long and tolerably strong, of a dull yellow colour, the radial and digital joints being tinged with dull orange-brown; the radial and cubital joints are short; the former is rather the shortest, and has its fore extremity on the outer side produced into a strong tapering

apophysis as long as the joint itself, and rather dilated at its extremity, very nearly resembling in this respect that of *Drassus troglodytes*, C. Koch. The digital joint is large, of an oval form, and longer than the radial and cubital joints together. The palpal organs are well developed, of a tumid-oval form behind, marked with two parallel fine brown circumferent lines; and there are some rather prominent processes towards their fore extremity.

This spider is nearly allied to *Drassus minusculus*, L. Koch (which appears to be rather common in France); but, I think, on a careful comparison of the two species, it is quite distinct. The differential characters are slight; but among them may be mentioned the closer proximity to each other of the eyes of the hind central pair, and a slight difference in the form of the genital aperture of the female. The only examples I have seen of *D. minusculus*, L. K., are also considerably smaller than those of *D. delinquens*.

Drassus pubescens.

Drassus pubescens, Thor. Recensio Critica Aran. Suec. p. 100, and Syn. Europ. Spid. p. 203; L. Koch, Die Arachn.-Fam. der Drassid. p. 123, tab. v. figs. 77-79; O. P. Cambridge, Trans. Linn. Soc. xxviii. p. 439.

A adult male of this rare and distinct spider was found, under the dry crust formed in small hollows on Bloxworth Heath, by the drying up of the muddy water contained in them, on the 16th of June, 1877. This is only the second example of the species yet found in England; and it enables me to fix the time of its occurrence, which I was unable to do in regard to the former example recorded in Linn. Trans. (*l. c. suprâ*).

Drassus bulbifer.

Drassus bulbifer, Cambr. Proc. Zool. Soc. June 1874, p. 386, pl. li. fig. 13.

An adult male of this spider was found at Lulworth, in Dorsetshire, in June 1877, and kindly sent to me by Mr. C. W. Dale, of Glanville's Wootton. The type of the species, described *l. c. suprâ*, was received among a number of spiders of many kinds collected by the late Mr. Richard Beck, of Cornhill, London. Being, at the time when these were sent to me, under the impression that some of them were obtained on the continent of Europe, I concluded that the example of *D. bulbifer* was a continental one. I have since had occasion to doubt this, and I feel convinced now that they were all English specimens. Some were, I know, found near London and others at Hastings; it is probable that the example

referred to of the present spider was from this latter locality; at any rate the example found by Mr. Dale settles the question of its being a British spider. So far as I am aware, it is not yet known on the continent. It cannot be mistaken for any, as yet known, British species of *Drassus*; its black abdomen marked with six pale spots clothed with white hairs on the upperside, and its yellow legs, the femora of the first two pairs being black, render it a very striking and distinct-looking spider. Between the four anterior white spots on the abdomen is a large, oblong-oval, shining, deep-brown-black patch.

Genus CLUBIONA, Latr.

Clubiona cærulescens.

Clubiona cærulescens, L. Koch, Die Arachn.-Fam. der Drassid. p. 331, pl. xiii. figs. 213-215.

Clubiona voluta, Cambr. Journ. Linn. Soc. xi. p. 533, pl. xiv. fig. 3.

When this spider was described under the last-mentioned name I had not had an opportunity of examining the female of *C. cærulescens*, L. K.; I have now no doubt of the identity of these two spiders. A second British example of the female was found at Bloxworth several years ago, and overlooked for the time among a number of others of the same genus.

Genus CHEIRACANTHIUM, C. Koch.

Cheiracanthium nutrix.

Cheiracanthium nutrix, Westr. Aran. Suec. p. 378; Cambr. Trans. Linn. Soc. xxviii. p. 531, pl. xlv. fig. 4.

The only British examples of this spider yet recorded were found in Lancashire and in Scotland; lately, in September 1877, one was found on Bloxworth Heath, by my son Robert Jocelyn.

Genus AGRÆCA.

Agræca brunnea.

Agelena brunnea, Bl. Spid. Great Brit. & Irel. p. 159, pl. x. fig. 102.

This is the spider to which is attributed the little white pear-shaped egg-cocoons attached to grass-stems, rushes, and other portions of low herbage, and frequently found in numerous localities. It is probable, however, that (in the south of England, at all events) the greater number of these are formed by an allied species, *A. proxima*, Cambr., this last species being an abundant one, while *A. brunnea* is very rare. During many years I have never found more than three or four ex-

amples of *A. brunnea*, *A. proxima* being for a long time mistaken for it. In spite of the frequent occurrence of the little egg-cocoons referred to, as well as of the last-mentioned spider, I have never yet been able satisfactorily to connect them together. The cocoons are covered over, very soon after they are made and the eggs deposited in them, with a coating of clay, which effectually destroys all their form and beauty. This coating of clay answers probably two ends:—first, the concealment of the cocoon and its protection from insect enemies; and, secondly, the protection of the eggs from the too powerful rays of the sun, dry clay being (as is well known) one of the best non-conductors of heat.

An adult female of *A. brunnea* was found at Bloxworth, Dorset, on the 2nd of June, 1876, and an adult male was received, in November 1877, from Mr. C. W. Dale, by whom it was found a short time previously at Glanville's Wootton, Dorset.

A. W. M. Van Hasselt, in a long paper upon the little pear-shaped cocoons referred to (*Tijdschr. Ent.* xix. pp. 28–42, pl. i. 1876), comes to the conclusion that there are certainly two, if not more, species of *Agræca* by which they are constructed; the cocoons differing perhaps in size, and the external coating of clay being possibly of specific importance.

Genus *LEIOCRANUM*, L. Koch.

Leiocranum praelongipes.

Drassus praelongipes, Cambr. Ann. & Mag. Nat. Hist. June 1861.

Leiocranum praelongipes, Cambr. Trans. Linn. Soc. xxviii. p. 439, pl. xxxiii. fig. 4.

On the 22nd of June, 1877, I met with this hitherto very rare spider in abundance among the coarse star-grass on the sand-hills close to the sea at Studland, Dorsetshire. Both sexes were present; but none had quite attained maturity.

Fam. *Agelenides*.

Genus *TEGENARIA*, Latr.

Tegenaria campestris.

Tegenaria campestris, Walck. Ins. Apt. tom. ii. p. 9; C. Koch, Die Arachn. viii. p. 34, pl. 263. figs. 615, 616; Cambr. Zool. for 1861, p. 7559, and Trans. Linn. Soc. xxviii. p. 443.

Adults of both sexes were found under old casks and among logs of wood in a fuel-house at Bloxworth in December 1876. Up to that time I had met with this spider but rarely, and always out of doors. I have more lately received it from Mr.

C. W. Dale, by whom adult females were found at Glanville's Wootton, Dorset.

Fam. **Pholcides**.

Pholcus phalangioides, Fuessl.

An opportunity occurring not long since of observing the mode in which this spider secured its prey, the following notes upon it will perhaps be worth recording.

A fly of tolerable size became entangled among the outer lines of the snare; the spider immediately approached, but no nearer than just to reach the fly with the legs of the hinder (or fourth) pair; it then drew silken lines from its spinners, and secured them to the fly with the same legs; this was immediately followed by a rapid alternate winding action upon the fly, effected also by the hinder pair of legs, occasionally assisted by one of those of the third pair; the fly was thus quickly and completely wound up, and then at once carried off to the recesses of the snare in the claws of the fourth pair of legs. No bite was inflicted upon the fly, which possibly may have been thus kept a living captive for days to come in the spider's larder. A very similar mode of securing their prey is also adopted by some species of *Epeirides*.

Fam. **Theridiides**.

Genus **PHOLCOMMA**, Thor.

Pholcomma gibbum, Westr.

Theridion projectum, Cambr. Zoologist, 1862, p. 7962.

An adult male and female of this curious little spider were found in the sheltered angle of a verandah at Bloxworth on the 19th of February, 1877, and another male in the same situation on the 10th of April following. These examples had probably lived through the winter in the adult state; those captured in former years were generally found adult from the beginning to the end of summer, and at the roots of heather.

Genus **THERIDION**, Walck.

Theridion familiare.

Theridion familiare, Cambr. Trans. Linn. Soc. xxvii. p. 418, pl. 55. fig. 15.

Adults of both sexes were found in the angles of the wood-work of doors of outbuildings at Bloxworth Rectory on the 12th of July, 1877. I have not met with this spider in any

other locality ; nor has it yet been noted upon the continent of Europe.

Theridion tepidariorum.

Theridion tepidariorum, C. Koch, Die Arachn.; O. P. Cambridge, Entomologist, July 1877, vol. x. p. 175.

On the 12th July, 1877, I met with an adult male of this species in the porch of Bloxworth Rectory. This example is very much smaller than those usually found in greenhouses and hothouses, and it is only the second example I have ever found in any other than these situations (*conf.* 'Entomologist,' x. p. 175, where an adult male is recorded as found in a carrot-bed in the kitchen garden at Bloxworth; this specimen is still smaller than the one found in the porch). It is probably a spider of great delicacy of constitution, and therefore of great rarity, except in such favourable situations as a greenhouse or hothouse, where it would naturally thrive well and grow to a comparatively large size.

Genus ERIGONE, Savigny.

Erigone (Nerienne, Bl.) longipalpis.

Nerienne longipalpis, Sund.; Cambr. Linn. Trans. xxviii. p. 447, pl. 34. figs. 23, 24.

Adults of both sexes of this spider were found, under débris &c., on the sands near the seashore at Studland, on the 22nd of June, 1877. I have hitherto found this species very rarely in the south of England, the more abundant (though very closely allied) forms being *Erigone dentipalpis*, Westr., and *E. atra*, Bl., both of which also occurred at Studland and in a similar situation.

Erigone (Nerienne) Clarkii.

Nerienne Clarkii, Cambr. Linn. Trans. xxvii. p. 441, pl. 56. fig. 20, and Ann. & Mag. Nat. Hist., Oct. 1875, p. 246.

An adult male of this rare spider was found under a piece of old board in the garden at Bloxworth, on the 24th of May, 1877.

Erigone (Drepanodus, Menge) albipunctata.

Nerienne albipunctata, Cambr. Linn. Trans. xxviii. p. 451, pl. 34. fig. 15, and p. 541.

An adult male and female were found among the coarse star-grass and other herbage on the sand-hills near the sea at Studland in June 1877. These are the first females I have met with; and they differ from the male only in the absence

of the great development of the falcēs so conspicuously characteristic of that sex. I have lately received an adult male of this spider from Mr. T. Workman, by whom it was found and kindly sent to me from the neighbourhood of Belfast.

Erigone (*Walckenaëra*, Bl.) *erythropus*.

Walckenaëra borealis, Cambr. Zoologist for 1862, p. 7967.

W. erythropus, Menge, Cambr. Linn. Trans. xxviii. p. 453.,

An adult male of this rare species was found among star-grass on the Studland sand-hills in June 1877.

Erigone (*Walckenaëra*, Bl.) *affinitata*.

Walckenaëra affinitata, Cambr. Zoologist, 1863, p. 8591; *id.* Linn.

Trans. xxviii. p. 454.

In company with the last spider I also found a single example of the adult male of this very rare and distinct species.

Erigone (*Walckenaëra*) *atro-tibialis*, sp. n. (Pl. XI. fig. 3.)

Adult female, length 1 line.

The *cephalothorax* is oval; the lateral constrictions on the margins of the caput are not very strong; but when looked at in profile there is a deep curved notch or indentation, caused by the slight elevation of the upper part of the caput and the rather unusual elevation of the thoracic junction. The colour of the cephalothorax is yellow; the caput and normal indentations strongly suffused with black.

The *eyes* are on black spots and in two transverse and almost equally curved rows, forming an oval figure; the foremost row is the shortest. The interval between those of the hind central pair is slightly less than that between each and the hind lateral eye next to it. The eyes of the fore central pair are nearly but not quite contiguous to each other, and appear to be rather the largest of the eight, the rest being very nearly of equal size. The fore laterals are very near to (though distinctly separated from) the fore centrals; those of each lateral pair are contiguous to each other and are placed obliquely on a slight tubercle. The height of the clypeus is equal to half that of the facial space.

The *legs* are moderately long, slender, not greatly differing in length; their relative length appears to be 4, 1, 2, 3; they are furnished with coarse hairs and a few erect slender bristles, and are of a yellow colour, the tibiae of all four pairs being black.

The *palpi* are moderate in length and strength; the radial

joint is nearly equal in length to the digital, and enlarges gradually from its hinder to its fore extremity, where its size is the same as that of the base of the digital joint. Their colour and armature are like those of the legs.

The *falces* are moderately strong, rather long, perpendicular, and a little divergent at their extremities, and their colour is yellowish suffused with sooty brown.

The *maxille*, *labium*, and *sternum* are similar in colour to the *falces*. The *maxillæ* are rather strong, short, inclined to the *labium*, but straight.

The *abdomen* is oval, thinly clothed with hairs, and of a sooty-black colour, strongly tinged with dull yellowish on the sides and underneath. The form of the genital aperture (fig. 3, *c*) is characteristic and conspicuous.

A single adult female of this species was found, on the 14th of June 1876, among dead leaves in a wood at Bloxworth. It differs rather from the typical *Walckenaëra* in the form of the *maxillæ*, but in no other respects sufficiently to justify its removal from that group.

Genus LINYPHIA, Latr.

Linyphia? incerta, sp. n. (Pl. XI. fig. 2.)

Adult female, length 1 line.

This spider is very nearly allied to *L. oblonga*, Cambr. (Trans. Linn. Soc. xxvii. p. 433). It is, however, larger and darker-coloured, though resembling that species very closely in general form and appearance. It may be distinguished readily by the larger size of the eyes, which, instead of being, as in *L. oblonga*, all of a pearly-white colour, have those of the fore central pair of a dark hue. The relative position of the eyes is the same in both species. The height of the clypeus exceeds half that of the facial space.

The *legs* are long, slender, their relative length being 4, 1, 2, 3. They are furnished with bristly hairs and long, fine, prominent spines; the length of the spine near the posterior extremity of the tibiæ of the fourth pair is equal to (if it does not exceed) three times the diameter of the joint.

The *palpi* are rather long, slender, and furnished with hairs and spine-like bristles.

The *falces* are long, strong, prominent at their base in front, and strongly directed backwards towards the *maxillæ*. These, as well as the *labium* and *sternum*, are similar to those of *L. oblonga*.

The *abdomen* is of an oblong-oval form, rather flattened, and projects considerably over the base of the cephalothorax.

It is of a dull brownish-yellow colour, with a somewhat darker tapering stripe along the middle of the fore half of the upperside. It is fairly clothed with coarse hairs of a darker colour than the abdomen itself. The genital aperture is large and conspicuous; its form is that of a circle with a portion (less than half) cut off; and it is suffused with red-brown and placed at the hinder part of a circular shining prominence. The spinners are partially concealed by the projecting around them of the somewhat folded integument of the hinder extremity of the abdomen, which shows very strongly several successive transverse folds of the skin, indicating doubtless the once segmented condition of the abdomen in the primæval spider.

A single example of this species was found by myself on the wall of the village school at Bloxworth, on the 5th of June, 1877.

I have included this spider doubtfully in the genus *Linyphia*, to which *L. oblonga* was referred by Dr. L. Koch on account of the spines on the legs. I have still, however, the same doubts as to the generic position of the present spider which I expressed in the description of *L. oblonga* (*l. c. suprâ*).

Linyphia furtiva.

Linyphia furtiva, Cambr. Linn. Trans. xxvii. p. 425, pl. 55. fig. 20.

An adult male and two females were found among star-grass on the Studland sand-hills in June 1877. I had only met with it previously (and that very rarely) on Bloxworth Heath.

Linyphia parvula, Westr.

Linyphia longipes, Cambr. Linn. Trans. xxvii. p. 430, pl. 55. fig. 24.

Two adult males were found among low herbage in a plantation on Muston Down, near Bloxworth, on the 11th of June, 1877. It had previously only been found (as British) in Lancashire. It is nearly allied to *L. aëria*, Cambr. (*vide* Ann. & Mag. Nat. Hist. 1875, vol. xvi. p. 252).

Linyphia linguata.

Linyphia linguata, Cambr. Linn. Trans. xxviii. p. 537, pl. 46. fig. 8.

During the summer of 1877 I received an adult female of this spider from Mr. C. W. Dale, by whom it was found at Glanville's Wootton; the only previous occurrence of it was near Berwick-on-Tweed, in the spring of 1872 (*l. c. suprâ*).

Fam. *Epeirides*.Genus *ZILLA*, Koch.*Zilla acalypha*, var. (Pl. XI. fig. 4.)

Epeira acalypha, Walck. Ins. Apt. ii. p. 50; Thorell, Syn. Eur. Spid. p. 454.

Female adult, length 2 lines.

The *cephalothorax* is rather strongly constricted on the lateral margins at the junction of the thorax and caput; this latter is rather produced, and the thoracic portion rounded, with the normal grooves and indentations well-marked; the highest point of the thorax is (when looked at in profile) rather higher than the upper part of the caput, the interval being depressed. The height of the clypeus is about equal to half that of the facial space. The colour of the cephalothorax is yellow. The margins, as well as a strong central longitudinal tapering bar reaching from just behind the eyes to the thoracic junction, black.

The *eyes* are in four pairs, seated on black tubercles: those of the two central pairs form a rectangle whose length is greater than its width, the hind centrals being larger than the fore centrals; those of each lateral pair are rather further from the hind laterals than these are from each other; when looked at sideways the lateral pairs range more nearly in a straight line with the hind than with the fore centrals, these latter being placed on a rather strong prominence.

The *legs* are moderate in length and strength; their relative length (as well as strength) is 1, 2, 4, 3; they are similar in colour to the cephalothorax, and are armed with not very strong spines; the femora are longitudinally but obscurely marked on the outer side with two almost confluent or diffused sooty lines; and the rest of the joints, particularly the tibiæ, are spotted and blotched with black.

The *palpi* are rather slender, moderate in length, and similar in colour and markings to the legs.

The *falces* are short and moderately strong, conical, directed backwards, and strongly suffused with brown.

The *maxille* and *labium* are of normal form, of a dark black-brown colour, tipped with yellowish.

The *sternum* is also of a similar colour.

The *abdomen* is large, of an oval form, rather pointed in front, where it projects greatly over the base of the cephalothorax; the upperside is of a yellowish-white or cream-colour, marked with a very distinctly defined, black marking, oblong behind, and continued almost to the fore extremity in the form

of a stripe, whose fore part runs off to a point and has a prominently projecting point on each side, making it of a somewhat *fleur-de-llys* form; on each side near the fore extremity is also another curved black marking; the oblong black area has four white spots near the middle in two pairs, forming an oblong figure; the foremost pair are much the largest. The sides are dark brown, marked obscurely, but somewhat obliquely, with two black stripes towards the hinder part; the underside forms a black area bounded on each side with a broken longitudinal stripe formed by some yellowish-white blotches.

The example above described was found and kindly forwarded to me by Mr. C. W. Dale from the Isle of Portland, in September 1877. It appears to me to be only a variety of *Zilla acalypha*, Walck.; but its markings are so very distinctly and strongly defined that I have been induced to figure it and to describe it at length: out of many hundred examples of the species that have come under my notice (both British and continental European) no such variety has ever been before observed.

N.B. The legs of the first two pairs in the figure (fig. 4, Pl. XI.) are rather too short.

Epeira Westringii.

Epeira Westringii, Thorell, *Recensio Critica Araneorum*, p. 106; *id.* Syn. Eur. Spid. pp. 22, 548.

This spider is closely allied to *E. cucurbitina*, Clk., resembling it remarkably in general appearance, structure, and colour; it may, however, be distinguished without difficulty (in the male sex at least) by the absence of the two dark longitudinal bands on the cephalothorax, and by the smaller size of the digital joints of the palpi (including the palpal organs); these latter are also a little different in their structure. I cannot at present lay hold of any such tangible distinctions between the *females* of *E. Westringii* and *E. cucurbitina*. Dr. Thorell remarks (Syn. Eur. Spid. p. 549) upon the difficulty of distinguishing these, and the more especially as there is another species (not yet found in England), *E. alpica*, L. Koch, equally closely allied to both those other spiders.

An adult male and, I believe, a female also were received at the end of June 1877 from Mr. C. W. Dale, by whom they were found at Glanville's Wootton. This is its first record as British.

Epeira adianta, C. Koch.

Males and females of this beautiful spider (all, however, im-

mature) were found, in their orbicular snares, at Lulworth, in June 1877. I have met with it also in various other localities; and probably it would be found sparingly in most of the wild heathy districts of the south of England.

Epeira diademata, Clerck.

It would be interesting to ascertain exactly at what period the young of this common spider begin to construct the orbicular snare characteristic of the family to which it belongs. On the 18th of May I found a brood of young which had effected their first change of integument; but they were still living in a certain sort of community, and spinning only irregular lines fixed in various directions to the surrounding plants.

Genus CYRTOPHORA, Sim.

Cyrtophora conica.

Epeira conica, Walck., Blackw. Spid. Great Brit. & Irel. p. 362, pl. xxvii. fig. 261.

On the 30th of May 1876 I discovered a very beautiful and perfect web of this spider, spun between the leaves of a pear-tree, the adult female occupying, as usual, the centre of the snare. Observing an unusual appearance in the web near her, I found on a close examination that a space above an inch in length, both above and below the centre of the snare, and enclosed between two adjoining radii, was warped across and across and wound about with white flocculus of an adhesive nature, very similar to that found on the lines of the snare of *Amaurobius ferox*, C. Koch. On a very slight movement of the web the spider raised itself upon the extremities of its tarsi, and by means of a strong muscular movement, aided no doubt by its own weight, imparted to itself a rapid vibratory motion for half a minute or more, repeating it on each disturbance of the web. I have noticed similar vibrations in some other Epeirids and also in *Pholcus phalangioides*. The vibration is probably intended to shake any insect entangled slightly in the outskirts of the snare still further into it; and the adhesive flocculus is doubtless to aid in the entanglement when the final struggle comes.

Genus XYSTICUS, C. Koch.

Xysticus versutus.

Thomisus versutus, Blackw. Spid. Gr. Brit. & Irel. p. 83, pl. iv. fig. 49.

Thomisus pallidus, Bl. l. c. p. 82, pl. iv. fig. 48.

Xysticus horticola, C. Koch, Die Arachn. iv. p. 74, tab. 129. figs. 296-298.

After a very careful examination of the types of this spider
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and a comparison with the type of *Xysticus pallidus*, Bl., and examples of *X. horticola*, C. Koch (the latter received from Dr. L. Koch), I feel no doubt whatever that these three species are identical. The form of the projections at the outer extremity of the radial joint of the male palpus is very striking, and presents a curiously differing appearance from every fresh point of view. This has, no doubt, in great measure, led to the mistaking of the different individuals for different species. *X. pallidus* is simply the pale (and only slightly spotted) variety. Dr. L. Koch agrees with me in considering the three spiders mentioned above to be of one species; but Dr. Thorell still doubts the identity of *T. versutus*, Bl., and *X. horticola*, C. Koch.

Xysticus sanctuarius.

Xysticus sanctuarius, Cambr. Trans. Linn. Soc. xxvii. p. 405, pl. 54. fig. 8.

Several examples of the adult male of this spider were received in September 1877 from Mr. C. W. Dale, by whom they were found at Lulworth, Dorset. It had previously only been found at Bloxworth. It appears to have been also found recently in several localities in France. (See *Oxyptila sanctuaria*, E. Simon, 'Arachnides de France,' vol. ii. p. 217.)

Genus THOMISUS.

Thomisus onustus, Walck.

Thomisus abbreviatus, Bl. Brit. & Ir. Spid. p. 90, pl. iv. fig. 54; Walck. Ins. Apt. tom. i. p. 516.

An immature female and male of this rare and pretty spider were received, in September 1877, from Mr. C. W. Dale, by whom they were found near Wareham, Dorset.

Genus PHILODROMUS, Walck.

Philodromus lineatipes, sp. n. (Pl. XI. fig. 5.)

Female immature, length 1 line.

In its general form and structure this spider resembles *P. aureolus*, Clk. The *cephalothorax* is of a dull brownish-yellow colour, marked on the sides (and on the upper part of the caput, between the eyes) with rather reddish brown, chiefly following the direction of the normal indentations; the ocular region has a few strong bristly hairs upon it.

The *eyes* are placed on slight tubercles, in the form of a crescent; they are small and differ very little in size. The interval between those of the hind central pair is greater

than that between each and the hind lateral eye on its side; and a similar relative distance (though not to so great an extent) obtains in regard to the eyes of the front row. The four central eyes form a quadrangular figure, whose foremost side is the shortest, and its posterior side the longest.

The *legs* are short and moderately strong; those of the hinder pair were wanting; but those of the first are rather shorter than those of the second and third, while these last two appear to differ very little in length; their colour is pale yellowish tinged with brown, the femora, genua, and tibiae being pretty distinctly marked with one or two longitudinal reddish-brown stripes, and they are furnished with hairs and bristles.

The *palpi* are similar in colour and armature to the legs.

The *falces*, *maxillae*, *labium*, and *sternum* are similar in colour to the legs.

The *abdomen* is of a short oval form, broader towards the hinder part than in front; it is of a dull yellowish red-brown hue marked with some whitish markings on the upperside: those on the fore part leave a longitudinal tapering central stripe; and those on the hinder part form several ill-defined transverse curved lines.

A single example was contained among the spiders forwarded to me several years ago, from Scotland, by Mr. J. W. H. Traill. I have hesitated hitherto to describe it as a new species, owing to the immaturity of the specimen. It is evidently allied to *P. aureolus*, Clk., and to *P. cespiticolis*, Walck.; but the striped legs appearing to me to distinguish it satisfactorily from these species, I now describe it, in the confident expectation that, when adults have been found, my view of its specific distinctness will be fully confirmed.

Genus *THANATUS*, C. Koch.

Thanatus hirsutus.

Philodromus hirsutus, Cambr. Zoologist, 1863, p. 8565; *id.* Trans. Linn. Soc. xxviii. p. 433.

An adult male and several adult females were found on the 22nd of June, 1877, at the roots of star-grass and other herbage on the Studland sand-hills. The male being new to science, I add here a few notes upon it.

Adult male, length rather over $1\frac{1}{2}$ line.

The pattern on both the *cephalothorax* and *abdomen* is similar to that of the female (fully described *l. c. supra*); upon the abdomen, however, it is much obscured by the paler parts being of a slightly sooty-grey hue, caused in some measure by

grey hairs ; and the whole spider is of a rather darker hue ; the legs also are longer. The *palpi* are short ; the radial and cubital joints are very short ; the former is a little shorter than the latter, and has not, so far as I can make out, any prominence or apophysis at the outer extremity ; the digital joint is of a narrow oval form, and exceeds in length the radial and cubital joints together ; the palpal organs are simple, consisting of a largish rather prominent oval lobe, with a small prominent corneous process near their fore extremity.

M. Simon writes ('*Arachnides de France*,' ii. 1875, p. 330), "This species is common on the sand-hills 'de la baie de Somme ;' it takes up its abode on the sand at the base of large grassy tufts. The male is unknown."

Fam. *Lycosides*.

Genus *PIRATA*, Sund.

Pirata Knorrii, Scop.

Pirata Knorrii, Cambr. Entomologist, 1877, p. 204.

Dr. L. Koch, of Nuremberg, has kindly sent me an example of this species, received by him from the Isle of Arran. It is nearly allied to, but quite distinct from, *P. piraticus*, Clk. & Blackw. Dr. Thorell (*Syn. Europ. Spid.* pp. 343, 344) gives the distinctions between *P. Knorrii* and *P. piraticus* at full length, as well as the difference of the former from *P. hygrophilus*, Thor., = *Lycosa piscatoria*, Bl.

This spider will probably be found dispersed over the marshy districts of the Scotch Highlands.

Genus *TARENTULA*, Sund.

Tarentula aculeata, Clerck.

Tarentula aculeata, Cambr. Entomologist, 1877, p. 205.

This spider has hitherto been confused with *T. pulverulenta*, Clk. = *Lycosa rapax*, Blackw. ; it is, however, a much larger spider, though resembling it very nearly in colours and markings ; the legs are also proportionally longer. The differences in this latter respect are given in full detail by Dr. Thorell (*vide Syn. Europ. Spid.* p. 327).

It is only lately (*l. c. suprà*) that *T. aculeata* has been recorded as a British species, from examples found at Braemar, and kindly given to me by Mr. J. W. H. Traill, of the University of Aberdeen ; it will probably be some day found generally dispersed over the Highlands of Scotland. Dr. L. Koch, of Nuremberg, has received it from the Isle of Arran.

Tarentula trabalis, Clerck.*Lycosa trabalis*, Clk., Simon, Arachn. de France, iii. p. 257.

An immature female of this distinct species was received in January 1877 from Mr. Edward Parfitt, of Exeter, by whom it was found near that city, and kindly sent to me for determination.

Mons. Eugène Simon, to whom it was subsequently submitted, is also of opinion that it is the same as *L. trabalis*, Clk., found by himself abundantly in France (*vide l. c. suprà*). It has not before been recorded in Great Britain.

The only known British species to which it bears any near resemblance in the general character of its markings is *Tarentula pulverulenta*, Clk. (= *Lycosa rapax*, Bl.).

It may, however, be easily distinguished from that species, in all its stages, by the yellow hue of the whole spider, and especially by the clearly defined, broad, dark, yellow-brown, lateral longitudinal bands on the cephalothorax. The legs are yellow, the femora being annulated with brown. In the adult state its much larger size will distinguish it without difficulty from *L. rapax*, Bl.

Genus LYCOSA, Latr. (Cambr.).

Lycosa proxima. (Pl. XI. fig. 6.)*Pardosa proxima*, C. Koch, Die Arachn. xv. p. 53, pl. 517. figs. 1453, 1454.

This spider is nearly allied to *L. obscura*, Bl., *L. riparia*, C. Koch, and *L. prativaga*, L. Koch; and a close comparison of its palpi and palpal organs is necessary in order to distinguish it satisfactorily. It is, however, quite distinct from all these; and among other marks of distinction may be noted the longer and more slender palpi of the male and the legs only annulated on the femoral joints. In the figure given of the palpal organs (fig. 6, *b*) the peculiar structure of those parts, which differs distinctly from that of the other species mentioned, may be seen.

This spider occurs not uncommonly in my kitchen-garden at Bloxworth, in the months of April and May; and I met with both sexes in abundance among low herbage on damp flats near the sea at Studland on the 22nd June, 1877.

It is now recorded for the first time as a British species.

Lycosa monticola, Clerck.*Lycosa monticola*, Clk., Cambr. Linn. Trans. xxvii. p. 398.

Until this year (1877) I have met with this spider only occasionally in Dorsetshire; but on the 11th of June last

I found it in abundance, both males and females, in the adult state, running about actively on the closely fed and extensive downs between Bloxworth and Blandford; none had yet their egg-sacs attached to the spinners.

Lycosa herbigrada, Blackw.

On the 15th and 16th of June, 1877, I had opportunities of observing the egg-sacs of this spider shortly after their commencement; these consisted each of a hollow disk of pure white silk; some were further advanced towards completion than others; and although the parent spider was with each of the cocoons, none had been yet attached to the spinners. The deposition of eggs in the cocoon probably takes but a very short time, and is most likely effected soon after the sac has attained a hemispherical form. The operation of spinning the opposite silken hemisphere over the eggs would be quickly performed; and the egg-sac is no doubt then at once attached to the spinners. The sac is of a pure white colour until the eggs are placed in it; it then assumes the greenish-olive tint usually observed when afterwards the spider bears it about with her until the young are hatched. The operation of making the egg-sac, laying the eggs in it, and completing it takes place usually under a stone, or beneath the dried crust of previous muddy puddles.

Lycosa herbigrada, although local, is an abundant spider on some parts of the heaths in the south of England, and is one of the prettiest and most distinctly marked of all our indigenous species.

It has been found in Sweden and Germany, but does not appear to have been yet met with in France (*vide* E. Simon, *Arachn. de France*, tome iii. p. 323).

Lycosa annulata.

Lycosa annulata, Thor., *Cambr. Ann. & Mag. Nat. Hist.* 1875, xvi. p. 256, pl. viii. fig. 10.

Pardosa hortensis, Sim. *Arachnides de France*, iii. p. 343.

When this spider was first recorded as a British species I was not able to fix any special locality for it. The examples found in my collection were obtained from Portland and at Bloxworth, or in the neighbourhood, but were mixed up with and mistaken for *Lycosa amentata*, Clk.; I have, however, during the past season, from the 11th to the end of May, found both sexes in the adult state, in tolerable abundance, in Bere-wood, near Bloxworth, at the Yarrells, Lytchett Minster, near Poole, and in other wooded localities in the neighbourhood. It will probably be found to be one of the most abundant

species of *Lycosa* in the woods and waste grounds of the south of England, as it also is, in similar situations, in most parts of France.

Fam. Salticides.

Genus HASARIUS, Simon.

Hasarius citus.

Salticus citus, Cambr. Zoologist, 1863, p. 8561.

An adult male of this spider was kindly sent to me in a living state for determination, in 1873, by Mr. F. Smith (of the British Museum). This example was found, I understood, among the botanical collections in the museum, and hence might be considered to have been imported from abroad among some dried plants. In October last (1877) another adult example of the same sex was received from the Rev. A. E. Eaton; this latter example was captured in an orchid-house at the Kew Gardens, where it was most probably introduced with exotic plants. This spider must therefore, so far as our present evidence goes, be considered merely an imported species. It is very nearly allied to *Hasarius Adansonii*, Savigny, but, I think, is distinct from it. This latter species is found in France, Spain, Syria, Egypt, Palestine, Greece, Mauritius, and Bombay. I have undoubted examples of *H. citus* from Manilla; and it is possible that it may eventually turn out to be only an unusually distinctly marked variety of *H. Adansonii*.

Genus MARPESSA, C. Koch.

Marpessa pomatia.

Marpessa pomatia, Walck., Simon, Arachn. de France, iii. p. 26.

Salticus Blackwallii, Clark, Blackw. Hist. Spid. Great Brit. and Irel. p. 62, pl. iii. fig. 34.

I have lately received from M. Simon both sexes of *M. pomatia*, Walck.; and, after a careful comparison of the two, I feel no doubt whatever that it is identical with *Salticus Blackwallii*, Clark. The single example found at Southport, Lancashire, and which formed the type of Mr. Hamlet Clark's species, still remains the only recorded British specimen. It is also a rare spider in France. The palpi and palpal organs of the male are exceedingly remarkable in their development.

List of the Spiders noted and described.

Atypus piceus, Sulz., p. 106.

Lethia patula, sp. n., p. 108.

Lethia albispiraculis, sp. n., p. 109,

Pl. XI. fig. 1.

- Gnaphosa anglica*, Cambr., p. 110.
Drassus delinguens, Cambr., p. 110.
 — *pubescens*, Thorell, p. 111.
 — *bulbifer*, Cambr., p. 111.
Chubiona cærulescens, L. Koch, p. 112.
Cheiracanthium nutrix, Westr., p. 112.
Agræca brunnea, Blackw., p. 112.
Leiocranum prælongipes, Cambr., p. 113.
Tegenaria campestris, Walck., p. 113.
Pholcus phalangioides, Fuessl., p. 114.
Pholcomma gibbum, Westr., p. 114.
Theridion familiare, Cambr., p. 114.
 — *tepidariorum*, C. Koch, p. 115.
Erigone longipalpis, Sund., p. 115.
 — *Clarkii*, Cambr., p. 115.
 — *albipunctata*, Cambr., p. 115.
 — *erythropus*, Cambr., p. 116.
 — *affinitata*, Cambr., p. 116.
 — *atro-tibialis*, sp. n., p. 116, Pl. XI. fig. 3.
Linyphia incerta, sp. n., p. 117, Pl. XI. fig. 2.
Linyphia furtiva, Cambr., p. 118.
 — *parvula*, Westr., p. 118.
 — *linguata*, Cambr., p. 118.
Zilla acalypha, Walck., var., p. 119, Pl. XI. fig. 4.
Epeira Westringii, Thorell, p. 120.
 — *adianta*, C. Koch, p. 120.
 — *diademata*, Clerck, p. 121.
Cyrtophora conica, Walck., p. 121.
Xysticus versutus, Blackw., p. 121.
 — *sanctuarius*, Cambr., p. 122.
Thomisus onustus, Walck., p. 122.
Philodromus lineatipes, sp. n., p. 122, Pl. XI. fig. 5.
Thanatus hirsutus, Cambr., p. 123.
Pirata Knorrii, Scop., p. 124.
Tarentula aculeata, Clk., p. 124.
 — *trabalis*, Clk., p. 125.
Lycosa proxima, C. Koch, p. 125, Pl. XI. fig. 6.
 — *monticola*, Clk., p. 125.
 — *herbigrada*, Blackw., p. 126.
 — *annulata*, Thorell, p. 126.
Hasarius citus, Cambr., p. 127.
Marpessa pomatia, Walck., p. 127.

EXPLANATION OF PLATE XI.

- Fig. 1. *Lethia albispiraculis*, sp. n., ♀, p. 109: *a*, spider, magnified; *b*, profile of cephalothorax; *c*, eyes and part of falces, from in front; *d*, tarsus and metatarsus of right leg of fourth pair, showing calanistrum; *e*, natural length of spider.
 Fig. 2. *Linyphia incerta*, sp. n., ♀, p. 117: *a*, spider, enlarged; *b*, profile; *c*, eyes and falces, from in front; *d*, genual and tibial joints of leg of fourth pair, showing the spines; *e*, maxillæ and labium; *f*, genital aperture; *g*, natural length of spider.
 Fig. 3. *Erigone atro-tibialis*, sp. n., ♀, p. 116: *a*, spider, magnified; *b*, profile; *c*, genital aperture; *d*, natural length of spider.
 Fig. 4. *Zilla acalypha*, Walck., var., ♀, p. 119: *a*, spider, enlarged; *b*, profile; *c*, eyes, from in front; *d*, natural length of spider.
 Fig. 5. *Philodromus lineatipes*, sp. n., ♀, p. 122: *a*, spider, enlarged; *b*, eyes, from behind; *c*, natural length.
 Fig. 6. *Lycosa proxima*, C. Koch, ♂, p. 125: *a*, spider, enlarged; *b*, digital joint and palpal organs, highly magnified; *c*, genital aperture of ♀; *d*, natural length of ♂.

XV.—Mr. James Thomson's Fossil Sponges from the Carboniferous System of the South-west of Scotland. By H. J. CARTER, F.R.S. &c.

[Plates IX. & X.]

OF these fossils I have given a preliminary notice in the 'Annals and Magazine of Natural History' for September